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Nebraska Tractor Tests

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Larsen

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1-1-1955

## Test 570: Ford Model 740

Tractor Museum

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Department of Agricultural Engineering  
Dates of test: November 7 to November 15, 1955  
Manufacturer: FORD MOTOR COMPANY, BIRMINGHAM, MICHIGAN  
Manufacturer's rating: Not rated

NEBRASKA TRACTOR TEST NO. 570

FORD 740

#### BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercury		
		Gal per hour	Hp-hr per gal	Lb per hp-hour		Cooling med	Air			
TEST B—100% MAXIMUM LOAD—TWO HOURS										
31.62	2001	2.989	10.58	0.576	0.00	181	56	28.700		
TEST C—OPERATING MAXIMUM LOAD—ONE HOUR										
30.13	2002	2.715	11.10	0.549	0.00	170	54	28.720		
TEST D—RATED LOAD—ONE HOUR										
28.06	2000	2.595	10.81	0.563	0.00	170	55	28.730		
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)										
28.02	1998	2.600	10.78	0.565	...	172	58	.....		
1.88	2127	1.157	1.62	3.750	...	132	57	....		
14.44	2059	1.832	7.88	0.773	...	151	58	.....		
27.00	1749	2.462	10.97	0.556	...	164	58	.....		
7.43	2097	1.462	5.08	1.199	...	142	59	.....		
21.11	2015	2.221	9.50	0.641	...	161	59	.....		
16.65	2010	1.956	8.51	0.716	0.00	153	58	28.720		
TORQUE (At Dynamometer)										
Eng rpm	2002	1873	1748	1622	1490	1370	1242	1113	989	864
Lb-ft	182.0	185.5	189.0	190.8	192.9	194.6	200.2	204.8	208.8	206.3
Dyn rpm	865	810	755	701	644	592	536	480	426	373

#### DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption			Water used gal per hour	Temp Deg F		Barometer inches of mercur
					Gal per hour	Hp-hr per gal	Lb per hp-hr		Cool- ing med	Air	
TEST H—RATED LOAD—TEN HOURS—2nd Gear											
22.02	1969	4.19	2003	6.07	2.257	9.76	0.625	0.00	166	44	28.710
TEST F—100% MAXIMUM LOAD											
28.32	2615	4.06	2007	9.27	2nd gear				162	45	28.580
TEST G—OPERATING MAXIMUM LOAD											
24.19	3117	2.91	2007	16.44	1st gear (part throttle) . . . .				168	32	28.860
27.40	2503	4.11	2006	8.36	2nd gear . . . . .				163	32	28.860
27.31	1762	5.81	1998	5.23	3rd gear . . . . .				156	31	28.800
24.27	728	12.50	1995	1.92	4th gear . . . . .				145	34	28.800
TEST J—OPERATING MAXIMUM LOAD											
21.64	2143	3.79	2014	16.68	2nd gear (part throttle) . . . .				161	34	28.740

#### TIRES, WHEELS AND WEIGHT

Tests F, G & H

Test J

Rear wheels		
Type	Pressed steel	Pressed steel
Liquid ballast	None	None
Added cast iron	538 lb each	None
Rear tires		
No. and size	Two 11-28	Two 11-28
Ply	4	4
Air pressure	12 lb	12 lb
Front wheels		
Type	Pressed steel	Pressed steel
Liquid ballast	None	None
Added cast iron	None	None
Front tires		
No. and size	Two 5.50-16	Two 5.50-16
Ply	4	4
Air pressure	28 lb	28 lb
Height of drawbar	22½ inches	23 inches
Static weight		
Rear end	3230 lb	2155 lb
Front end	1082 lb	1060 lb
Total weight as tested with operator	4487 lb	3390 lb

#### HORSEPOWER SUMMARY

	Drawbar	Belt
1. Sea level (calculated) maximum horsepower (based on 60° F. and 29.92" Hg)	29.22	32.84
2. Observed maximum horsepower (tests F and B)	28.32	31.62
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	21.92	27.91

We, the undersigned, certify that this is a true and correct report of official tractor test No. 570.

L. F. LARSEN  
Engineer-In-Charge

L. W. HURLBUT  
G. W. STEINBRUEGGE  
J. J. SULEK  
Board of Tractor  
Test Engineers

## EXPLANATION OF TEST REPORT

**TEST A:** The manufacturer's representative operates the tractor for a minimum of 12 hours using light to heavy drawbar loads in each gear.

This serves as a period for limber up, general observation and adjustments. Adjustments that are permissible include valve tappet clearance, breaker point gap, spark plug gaps, clutch and others of a similar nature. No new parts or accessories can be installed without having mention made of it in the report.

No data are recorded during this preliminary run except the time that the engine is operated.

### BELT HORSEPOWER TESTS

**TEST B:** The throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is at the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

This test is designed to determine maximum belt horsepower of the tractor at rated speed and to measure fuel consumption at the maximum power on the belt.

**TEST C:** For tractors with carburetors the best fuel economy does not always occur when the engine develops maximum power at rated speed. Test C is intended to allow the manufacturer's representative to select a more economical fuel setting even though there is a slight loss of power. *This more practical carburetor setting is used in all later tests except test F.* The throttle valve is held wide open and load adjusted to give rated rpm. Tests B and C are the same for diesel tractors, which have an altogether different fuel system.

**TEST D:** The throttle control lever is set so that the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.

This rating is somewhat less than the maximum belt horsepower in order that the operator may have a certain amount of reserve.

### TEST E:

**Varying load** serves to show the range of engine speeds when the engine is controlled by the governor during the following varied loads, of 20 minutes each: rated load, no load,  $\frac{1}{2}$  rated load, maximum load at wide open throttle valve,  $\frac{1}{4}$  and  $\frac{3}{4}$  rated load.

The average result of this test shows the average power and fuel consumption. Since the average tractor is subjected to varying loads, these data serve well in predicting fuel consumption and efficiency of a tractor in general use.

**Torque, lb-ft at dynamometer,** is obtained with wide open throttle and sufficient load is applied to give several readings.

### DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. All tests are made on the same dirt test course which is maintained by grading, sprinkling and rolling

so that it remains very nearly the same throughout the season. The same tires, wheels and weights are used for all tests except J and K.

**TEST F:** A drawbar test, the results of which are used to determine the rated drawbar horsepower in test H. The carburetor is set to develop maximum power as in test B. The rated gear recommended by manufacturer as plow gear is used in this test. The drawbar load is adjusted to give rated engine speed.

**TEST G:** Maximum drawbar horsepower is determined in each gear when the carburetor is set for fuel economy as in test C. The throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed.

When operating in low gear it is not uncommon for the tractor to develop less drawbar horsepower than in rated gear because of excessive wheel slippage. When excessive wheel slippage occurs the load is reduced until slippage approaches 16%. When the load is reduced it is necessary to operate the tractor engine at part throttle and control engine speed by governor action.

**TEST H:** Intended to test the ability of the tractor to run continuously for 10 hours at rated drawbar horsepower and to determine the fuel consumption during that time. Rated drawbar horsepower is 75% of 100% maximum drawbar horsepower (Test F), corrected to standard conditions.

When operating at rated load the throttle control lever is set to maintain rated engine speed. This rating is less than maximum drawbar horsepower in order that the operator may have a certain amount of reserve.

**TEST J:** The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor when compared with test G.

Removal of wheel weights generally increases wheel slippage and decreases drawbar horsepower.

**TEST K:** Similar to test J except that the smallest tires and lightest wheels offered by the manufacturer are used.

